

**MATH 249**  
**Worksheet #1**

1. (a) Solve for x:  $|2x + 1| \leq |x - 2|$   
(b) Solve for x:  $\frac{3}{x+1} > \frac{1}{3}$ .
2. Find the radius and centre of the circle  $x^2 + 4x + y^2 - 2y = 11$ .
3. Solve for x:  
(a)  $|x + 1| + 2 > 0$   
(b)  $\frac{3}{x+1} \geq \frac{2}{x+3}$ .
4. Given four lines  $l_1 : 3x + 2y = 1$   $l_2 : 2y - 3x = 0$   $l_3 : 3x - 2y = 0$  and  $l_4 : 2x - 3y = 2$  choose all which are  
(a) parallel  
(b) perpendicular.
5. Solve for x:  
(a)  $\frac{1}{x+1} \leq 1 + x$   
(b)  $|3x - 2| > 0$ .
6. Find an equation of the line (a) perpendicular (b) parallel to the x-axis passing through the point  $(-1, 3)$ .
7. Solve for x:  
(a)  $3x + 7 > x^2$   
(b)  $\frac{x}{2} < \frac{2}{x+3}$ .
8. Which of the given circles has bigger radius  
 $x^2 - 6x + y^2 = 7$  or  $x^2 + y^2 + 2y = 15$  ?
9. Simplify for  $h \neq 0, 7$   $\frac{\frac{3h+4}{7-h} - \frac{4}{7}}{\frac{25h}{7}}$ .

10. Simplify and find the restrictions on  $x$   $\frac{1}{1 + \frac{1}{x+1}}$ .
11. Simplify and find the restrictions on  $x$   $\frac{x^3 + 5x^2 + 6x}{12 + x - x^2}$ .
12. Simplify and find the restrictions on  $x$   $\frac{x}{x^2 + x - 2} - \frac{2}{x^2 - 5x + 4}$ .
13. Solve  $\frac{x}{x-1} < \frac{1}{x+1}$ .
14. Solve  $\frac{x}{x-1} > \frac{4}{x}$ .